Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

DRAFT
Title V, Operating
Permit: V-07-036
AK Steel-Ashland Works-Coke Plant
Ashland, Kentucky 41105-0191
August 31, 2007
Babak Fakharpour, Reviewer

SOURCE ID:	21-019-00027
SOURCE A.I. #:	43192
ACTIVITY ID:	APE20040001

SOURCE DESCRIPTION:

AK Steel Coke plant, is a by-product, coke production facility located at 400 East Winchester Avenue in Boyd County, Kentucky.

Coal is unloaded from railcars, transferred from storage, mixed, crushed, and charged to the coke ovens via belt conveyors and larry cars. The coke oven battery #3 is made up of a row of 76 individual ovens that are 4 meters high. Coke oven battery #4 has 70 ovens and 5 meters tall. In the coking process, coal is cooked, driving off volatile compounds from the coal as gases, to form carbon-rich coke. The byproduct gases are recovered and then the clean coke oven gases are used as fuel for heating the coke ovens and boilers.

Coal is charged through the three charge holes on the top of each oven by a technique called "staged charging". When the conversion of coal to coke is complete, the oven is disconnected from the gas collecting main and the coke is pushed out of the "coke side" of the oven into a rail car. The rail car with the hot coke is moved to the quench area where the hot coke is flooded with water.

There are other secondary activities at the source that include storage tanks, and waste water treatment plant to treat the weak ammonia liquor generated from the coke by-product plant and recycle acid gas back to the sulfur recovery unit.

The facility is a Title V major source of particulate matter, sulfur dioxide, nitrogen oxides, volatile organic compounds, carbon monoxide, and HAP emissions. This source is located in an attainment area for all pollutants except for Ozone (8 hour) and $PM_{2.5}$.

COMMENTS:

Type of control and efficiency:

- Coal and coke handling particulate emissions are controlled with wet suppression (99% at coal crushing, 98% for the rest)
- Coke oven emissions from the charging process are controlled using stage charging (99.9%)
- Coke oven emissions from coke oven doors, topside ports, and offtakes are controlled using work practice standards and inspection. Luting material is used to seal leaking doors, ports, and offtakes (98.9%, 99.6%)
- Coke oven emissions during coke pushing are controlled by hood cars that are re-designed pursuant to Agreed Order DAQ-97010. A baghouse controls the captured emissions (99.23% capture, 98.15% baghouse)
- Quenching emissions are captured by baffles in the quench tower(72.6%)
- Emissions (primarily benzene, toluene, xylene, phenol, and coke oven emissions) from the

COMMENTS (CONTINUED):

coke oven gas recovery plant are controlled with gas blanketing and a leak detection and repair program for pipeline equipment that handles and processes the recovered by-products (100%)

- SO_2 emissions from the combustion of coke oven gas in battery underfiring, boilers, and flares are controlled by coke oven gas desulfurization in the Sulfiban plant (99%). An incinerator on the Sulfiban controls tail gas emission by oxidizing H_2S to SO_2 prior to venting to the atmosphere (93.5% for SO_2)
- Emergency venting from the coke ovens during the coking process is controlled by the emergency flares (>99%)
- Clean coke oven gas not combusted elsewhere in the plant are combusted in the excess coke oven gas flare (>99%)

Emission factors are based on AP-42, observations, material balance, and consultant.

Applicable regulations:

- 401 KAR 51:017, Prevention of Significant Deterioration of Air Quality (previous BACT/Laer determinations).
- 401 KAR 63:010, Fugitive Emissions.
- 401 KAR 60:005, incorporated by reference 40 CFR Part 60, Subpart Y, Standards of Performance for Coal Preparation Plants.
- 401 KAR 61:020, Existing Process Operations.
- 401 KAR 59:010, New Process Operations.
- 401 KAR 63:002, incorporated by reference 40 CFR Part 63, Subpart L, National emission standards for coke oven batteries.
- 401 KAR 61:140, Existing By-product Coke manufacturing Plants.
- 401 KAR 63:002, incorporated by reference 40 CFR Part 63, Subpart CCCCC, National emission standards for coke ovens: Pushing, Quenching, Soaking, and Battery stacks.
- 401 KAR 61:015, Existing Indirect Heat Exchangers.
- 401 KAR 59:015, New Indirect Heat Exchangers.
- 401 KAR 63:015, Flares.
- 401 KAR 52:020, Title V permits.
- 401 KAR 57:002, incorporated by reference 40 CFR Part 61, Subpart L, National Emission Standards for Benzene Emissions from Coke By-product Recovery Plants.
- 401 KAR 57:002, incorporated by reference 40 CFR Part 61, Subpart FF, National Emission Standards for Benzene Waste Operations.
- 401 KAR 57:002, incorporated by reference 40 CFR Part 61, Subpart V, National Emission Standards for Equipment Leaks (Fugitive Emission Sources)

Notes:

Coke oven battery #4 is under Kentucky regulations for process operation along with a previous PSD determination, and federal MACT regulations for coke oven batteries. In a letter dated November 10, 1993, ARMCO Steel Company (now AK Coke) elected an extension of the compliance date for emission limits in §63.304(b)(1) for #4 battery in lieu of the applicable emission limitations in §63.302 or 63.303.

EMISSION AND OPERATING CAPS DESCRIPTION:

EPA's June 8, 1977, Pre-Construction Review and Final determination includes 113 tons coal charged/hr based on a 24-hour average, as a condition for battery #4 also, BACT to be used to limit emissions of sulfur dioxide and particulate matter.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.